

Listing of Claims

1-58. (Canceled).

59. (Currently Amended) An isolated population of ~~isolated~~ human postnatal deciduous dental pulp multipotent stem cells, wherein the stem cells are from a postnatal deciduous tooth; stem cells in the population differentiate into a neural cell, an adipocyte, or an odontoblast;~~and wherein the stem cells in the population express CD146 wherein the isolated human postnatal dental pulp multipotent stem~~ stem cells in the population can proliferate to over 140 population doublings;~~and stem cells in the population induce the formation of bone when transplanted *in vivo*.~~

60. (Currently Amended) The ~~An~~ isolated clonal population of human postnatal deciduous stem cells of claim 59, wherein the human postnatal deciduous dental pulp multipotent stem cells are ~~obtained~~ from a postnatal deciduous tooth and wherein the human postnatal deciduous stem cells induce formation of bone, but do not form bone, when transplanted *in vivo*.

61. (Currently Amended) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein ~~the human postnatal deciduous dental pulp multipotent stem cells in the population~~ express STRO-1, ALP, matrix extracellular phosphoglycoprotein, basic fibroblast growth factor, endostatin, or any combination thereof when cultured *in vitro*.

62. (Currently Amended) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein ~~human postnatal deciduous dental pulp multipotent stem cells in the population~~ express CBFA1, ALP, MEPE, BSP, DSPP, or any combination thereof following mineralizing induction.

63. (Currently Amended) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein ~~human postnatal deciduous dental pulp~~

~~multipotent stem~~ cells in the population express CBFAl, Osterix, Osteocalcin, or any combination thereof following induction with BMP-4.

64. (Currently Amended) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein ~~human postnatal deciduous dental pulp multipotent stem~~ cells in the population express nestin, β III tubulin, glutamic acid decarboxylase, neuronal nuclei, glial fibrillary acidic protein, neurofilament M, 2',3'-cyclic nucleotide-3'-phosphodiesterase, or any combination thereof following neural induction.

65. (Previously Presented) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein the human postnatal deciduous dental pulp multipotent cells are transfected with a nucleic acid segment.

66. (Canceled).

67. (Withdrawn and Previously Presented) A method to generate bone in an organism, comprising
implanting at least one human postnatal deciduous dental pulp multipotent stem cell of the isolated population of human postnatal dental mutlipotent stem cells of claim 59 into the organism, thereby generating bone in the organism.

68. (Withdrawn and Previously Presented) The method of claim 67, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted after mineralizing induction or induction with BMP-4.

69. (Canceled).

70. (Canceled).

71. (Withdrawn and Previously Presented) The method of claim 67, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted to reduce or ameliorate trauma within the organism.

72. (Withdrawn and Previously Presented) The method of claim 71, wherein the trauma is a bone degenerative disease or a physical injury.

73. (Withdrawn and Previously Presented) The method of claim 72, wherein the bone degenerative disease is osteoporosis.

74. (Withdrawn and Previously Presented) The method of claim 72, wherein the physical injury is due to joint replacement, hip replacement, or root canal.

75. (Withdrawn and Previously Presented) The method of claim 67, wherein the human postnatal deciduous dental pulp multipotent stem cell has been expanded ex vivo.

76. (Withdrawn and Previously Presented) The method of claim 67, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted in combination with a carrier.

77. (Withdrawn and Previously Presented) The method according to claim 76, wherein the carrier comprises hydroxyapatite, tricalcium phosphate, or hydroxyapatite and tricalcium phosphate.

78. (Withdrawn and Previously Presented) A method to produce human neural tissue comprising implanting at least one human postnatal deciduous dental pulp multipotent stem cell of the isolated population of human postnatal dental mutlipotent stem cells of claim 59 in a subject, thereby producing neural tissue.

79. (Canceled).

80. (Withdrawn and Previously Presented) The method of claim 78, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted following neural induction.

81. (Withdrawn and Previously Presented) The method of claim 78, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted into neural tissue contained within the organism.

82. (Withdrawn and Previously Presented) The method of claim 78, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted to reduce or ameliorate neural trauma within the organism.

83. (Withdrawn and Previously Presented) The method of claim 82, wherein the neural trauma is a neural degenerative disease or a physical injury.

84. (Withdrawn and Previously Presented) The method of claim 83, wherein the neural degenerative disease is Alzheimer's disease or Parkinson's disease.

85. (Withdrawn and Previously Presented) The method of claim 78, wherein the human postnatal deciduous dental pulp multipotent stem cell is expanded ex vivo.

86. (Withdrawn and Previously Presented) A method to produce human adipose tissue, comprising implanting at least one human postnatal deciduous dental pulp multipotent stem cell of the isolated population of human postnatal dental multipotent stem cells of claim 59 into an organism, thereby producing human adipose tissue.

87. (Canceled).

88. (Withdrawn and Previously Presented) The method of claim 86, wherein the human postnatal deciduous dental pulp multipotent stem cell is implanted following adipocyte induction.

89. (Withdrawn and Previously Presented) A method to generate dentin, comprising implanting at least one human postnatal deciduous dental pulp multipotent stem cell of the isolated population of human postnatal dental mutlipotent stem cells of claim 59 into an organism, thereby generating dentin.

90. (Withdrawn and Previously Presented) A method to generate dentin comprising

- a. contacting pre-existing dentin with the isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, and
- b. incubating the pre-existing dentin and the dental stem cells to produce treated dentin.

91. (Canceled).

92. (Withdrawn and Previously Presented) The method of claim 90, wherein the pre-existing dentin is contacted with the dental stem cell *in vitro*.

93. (Withdrawn and Previously Presented) The method of claim 90, wherein the pre-existing dentin is contained within a tooth.

94. (Withdrawn and Previously Presented) The method of claim 90, further comprising washing the dentin with a fluid.

95. (Withdrawn and Previously Presented) The method of claim 91, the fluid is water, a biological solvent, or a biological buffer.

96. (Withdrawn and Previously Presented) The method of claim 90, wherein further comprising washing the pre-existing dentin with an acid solution or a base solution.

97. (Withdrawn and Previously Presented) The method of claim 96, wherein the acid solution is selected from the group consisting of acetic acid, phosphoric acid, formic acid,

sulfuric acid, hydrochloric acid, hydrofluoric acid, hydroiodic acid, nitric acid, or hydrobromic acid.

98. (Withdrawn and Previously Presented) The method of claim 96, wherein the acid solution has a concentration of between 0.01 % and 100 % acid.

99. (Withdrawn and Previously Presented) The method of claim 96, wherein the base solution comprises a base selected from the group consisting of sodium hydroxide, potassium hydroxide, or ammonium hydroxide.

100. (Withdrawn and Previously Presented) The method of claim 96, wherein the base solution has a concentration of between 0.01 % and 100 % base.

101. (Withdrawn and Previously Presented) The method of claim 90, wherein dentin is generated in response to trauma to the tooth.

102. (Withdrawn and Previously Presented) The method of claim 101, wherein the trauma is a root canal.

103. (Canceled).

104. (Previously Presented) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 60, wherein the postnatal deciduous tooth is an incisor.

105. (Previously Presented) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, obtained by the process of:
separating pulp from a remnant crown of a human postnatal deciduous tooth;
digesting the pulp in collagenase and dispase to form digested pulp;
producing a single cell suspension from the digested pulp; and

isolating single cells that adhere to a tissue culture surface from the single cell suspension.

106. (Previously Presented) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein the multipotent stem cells generate mineralized tissue following transplantation *in vivo*.

107. (Canceled).

108. (Withdrawn and Previously Presented) A method for isolating a human postnatal deciduous dental pulp multipotent stem cell, comprising:

separating pulp from a remnant crown of a human postnatal deciduous tooth;

digesting the pulp in collagenase and dispase to form digested pulp;

producing a single cell suspension from the digested pulp; and

isolating single cells that adhere to a tissue culture surface from the single cell[[s]] suspension;

thereby isolating the human postnatal deciduous dental pulp multipotent stem cell of claim 59.

109. (Canceled).

110. (Previously Presented) ~~The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59,~~ An isolated human postnatal deciduous dental pulp multipotent stem cell ~~wherein the cells in the population have the characteristics of a human postnatal deciduous dental pulp multipotent stem cell~~ as deposited with the American Type Culture Collection (ATCC) as PTA-11551, wherein the stem cell[[s]] induces the formation of bone when transplanted *in vivo*.

111. (Currently Amended) A clonal cell isolated from the isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim [[59]] 60, wherein the

stem cells express neural markers induces the formation of bone when transplanted into the dentate hippocampus of an immunocompromised mouse *in vivo*.

112. (New) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein the population express STRO-1, ALP, matrix extracellular phosphoglycoprotein, basic fibroblast growth factor and endostatin when cultured *in vitro*.

113. (New) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, the population express CBFA1, ALP, MEPE, BSP and DSPP following mineralizing induction.

114. (New) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein the population express CBFA1, Osterix and Osteocalcin following induction with BMP-4.

115. (New) The isolated population of human postnatal deciduous dental pulp multipotent stem cells of claim 59, wherein the population express nestin, β III tubulin, glutamic acid decarboxylase, neuronal nuclei, glial fibrillary acidic protein, neurofilament M and 2',3'-cyclic nucleotide-3'-phosphodiesterase following neural induction.

116. (New) A composition comprising a carrier and the cells deposited with the American Type Culture Collection (ATCC) as PTA-11551, wherein the composition induces the formation of bone when transplanted *in vivo*.

117. (New) The composition of claim 116, consisting of the carrier and the cells deposited with the American Type Culture Collection (ATCC) as PTA-11551, wherein the composition induces the formation of bone when transplanted *in vivo*.

118. (New) A composition comprising a carrier and a mixed population of human postnatal deciduous dental pulp multipotent stem cells that induce formation of bone growth when implanted *in vivo* and can proliferate for over 140 population doublings, wherein cells in the population express CD146.